City of Alexandria, Virginia

Combined Sewer System Permit and Long-Term Control Plan Update

Old Town Civic Association
November 13, 2013

Department of Transportation and Environmental Services (T&ES)

Lalit Sharma

Division Chief, T&ES-Office of Environmental Quality

ECO-CITY ALEXANDRIA

AGENDA

- City's Combined Sewer System (CSS)
- City's CSS Permit History
- Hunting Creek Total Maximum Daily Load (TMDL)
- Long-range and Near-term Permit Requirements
- Public Outreach and Participation

Types of Sewer Systems

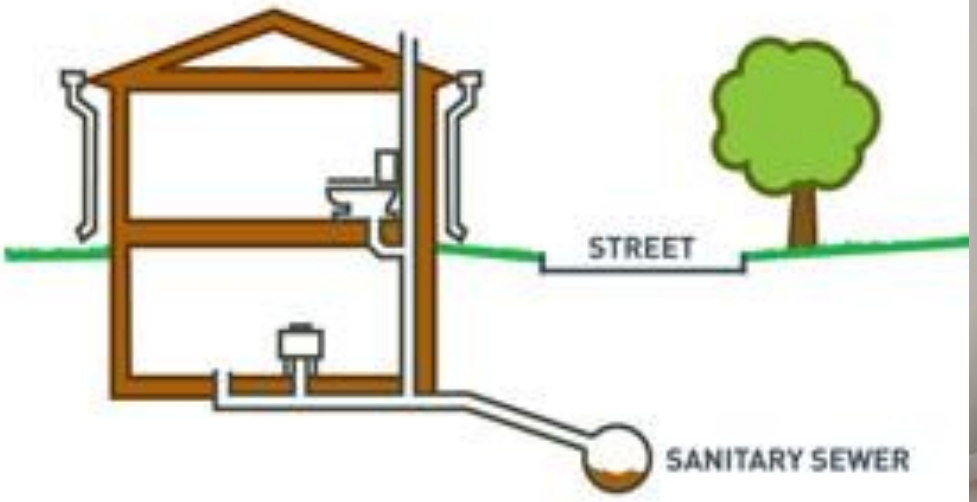
Separate Sewer Systems: Conveyance system involving two separate sets of pipes, one for carrying only stormwater, and the other for carrying only sanitary flows (wastewater/sewage).

Combined Sewer System: Conveyance system involving single set of pipes that carries both stormwater, and sanitary flows (wastewater/sewage).

Stormwater

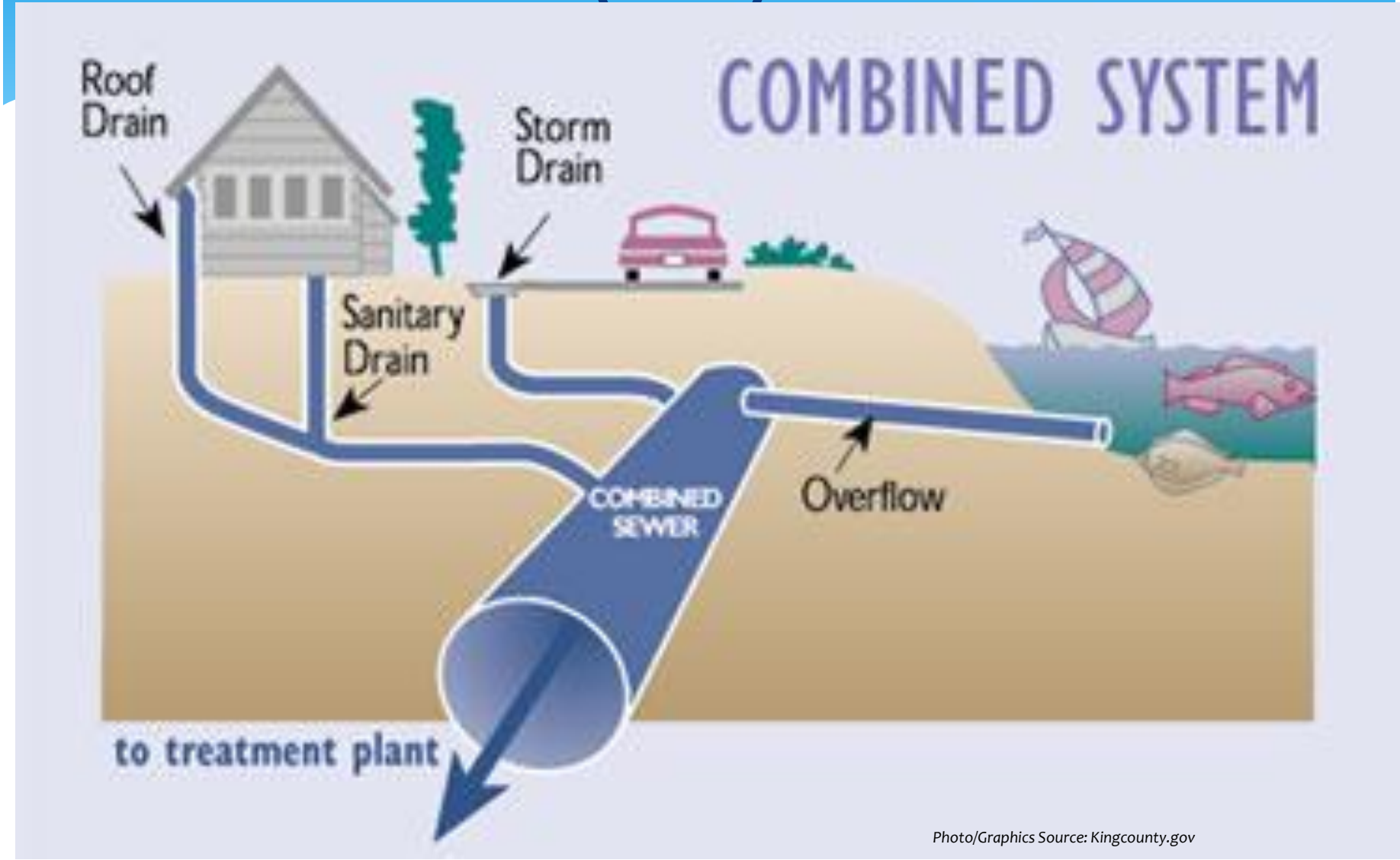
Photo/Graphics Source: Clarksville Stormwater

Sanitary Sewer



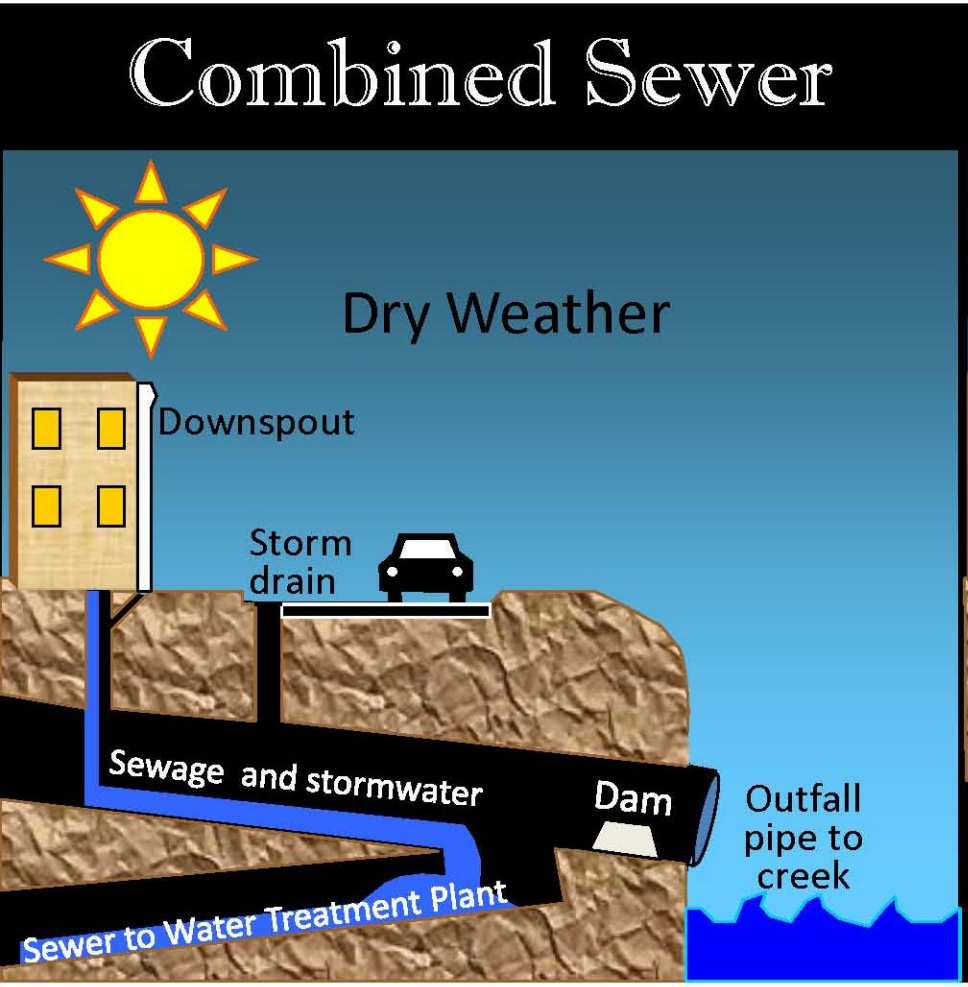
Photo/Graphics Source: Global Innovative Campus

Combined Sewer System (CSS)

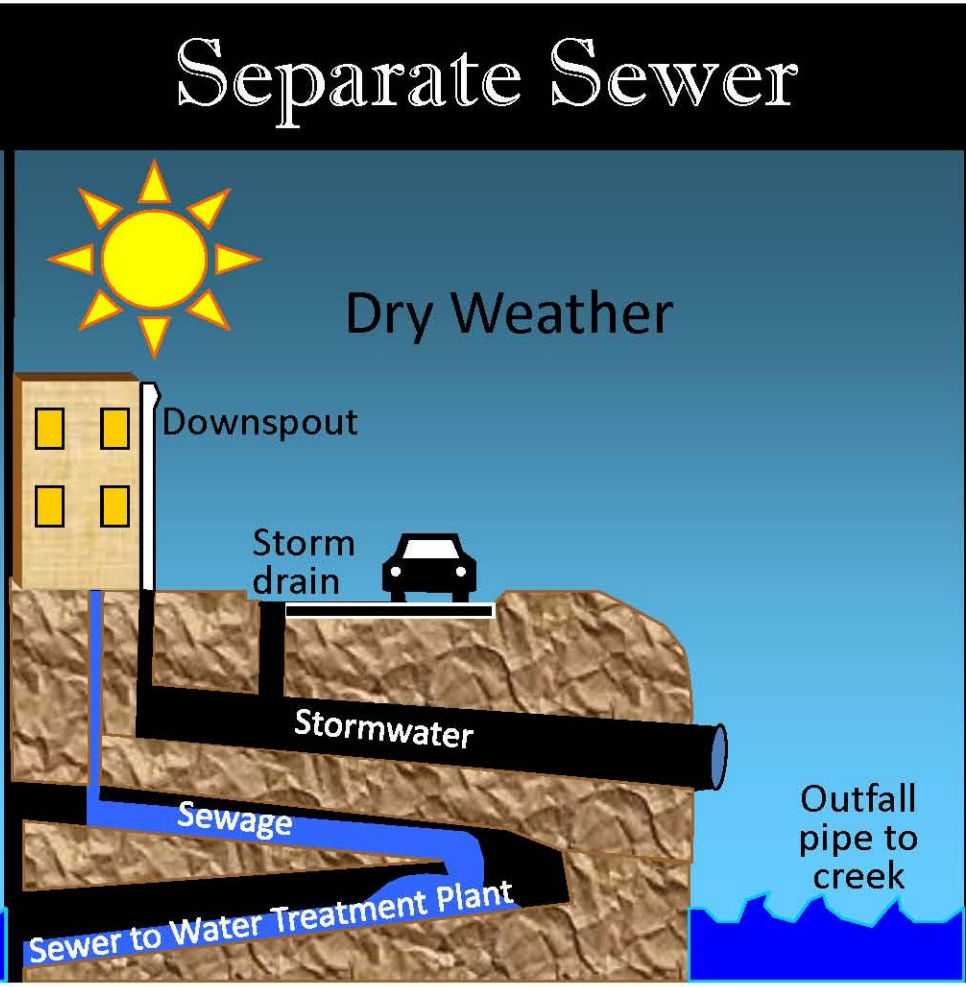


Photo/Graphics Source: Kingcounty.gov

Types of Sewers in Alexandria



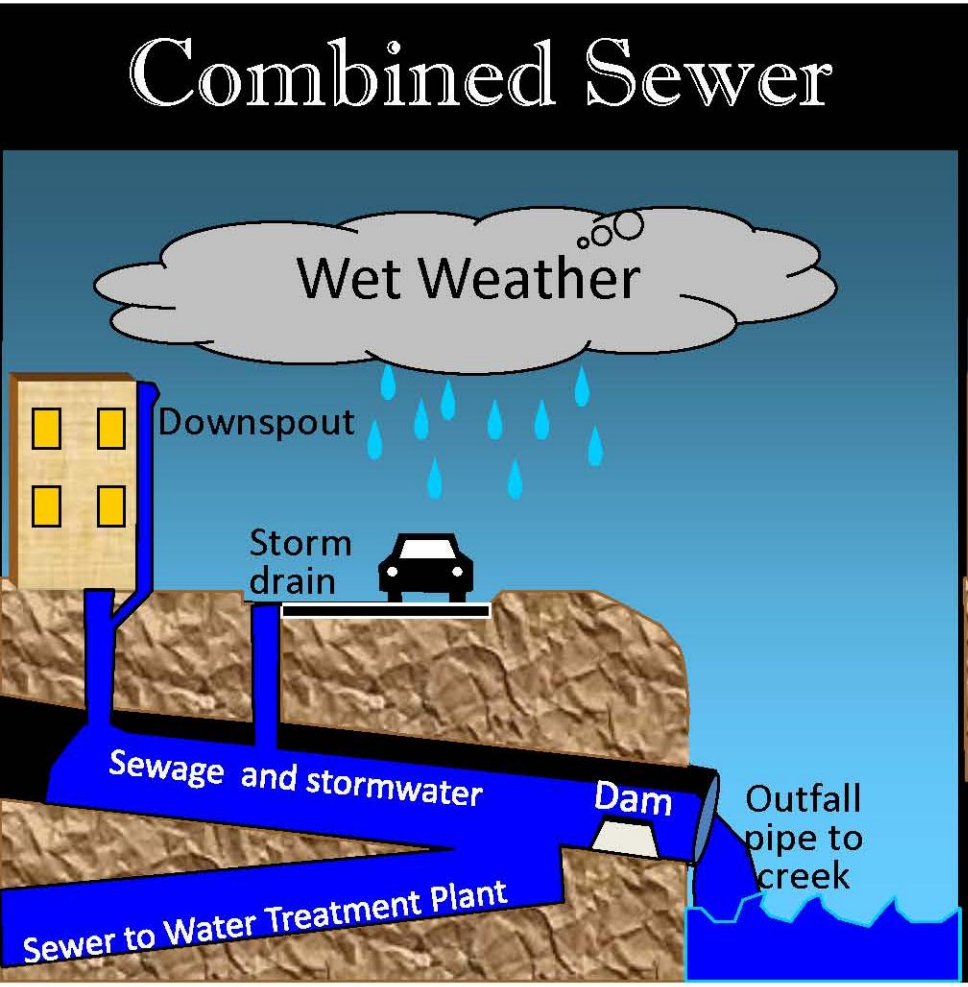
6.4% of Alexandria

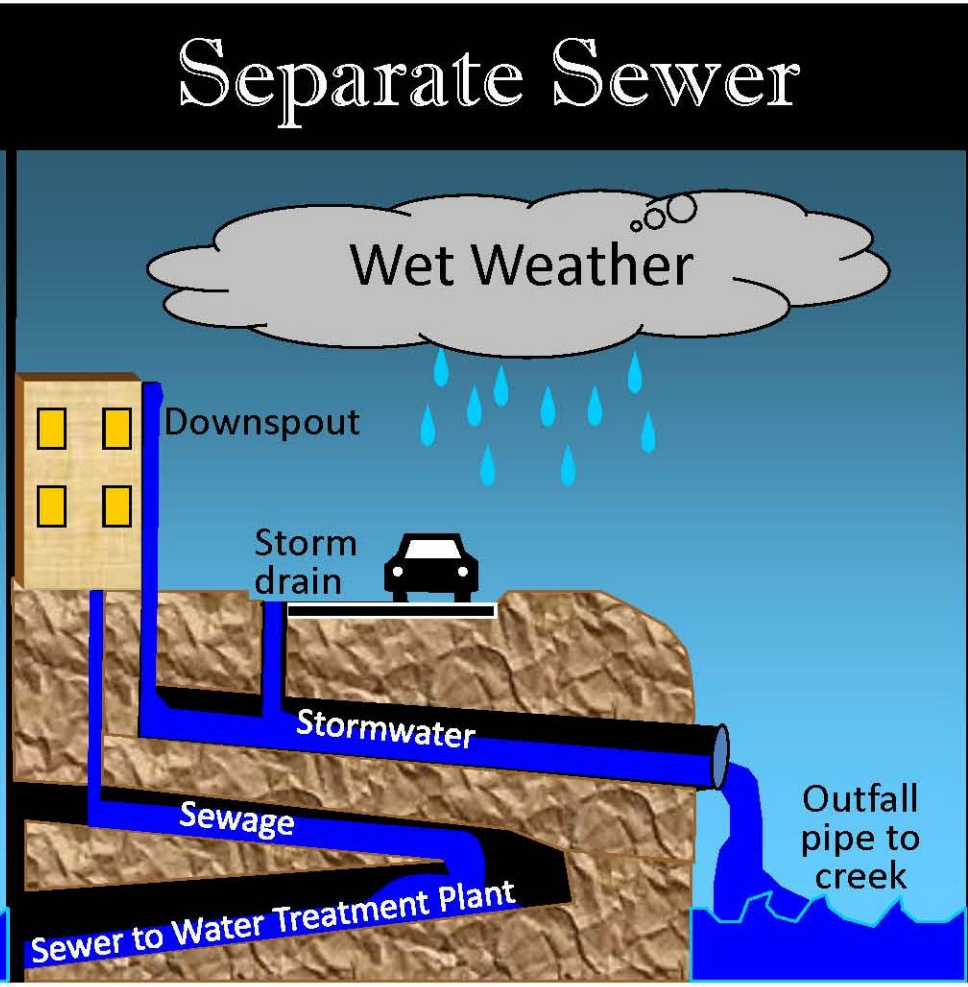


93.6% of Alexandria

Photo/Graphics Source: www.phillyriverinfo.org

Types of Sewers in Alexandria





6.4% of Alexandria

93.6% of Alexandria

Photo/Graphics Source: www.phillyriverinfo.org

Location of Combined Sewer System (CSS) Communities

* CSS communities are concentrated in older communities in the NE and Great Lakes regions.

* Currently, 772 NDPES permits authorize discharges from 9,348 CSO outfalls in 32 states and DC.

Photo/Graphics Source: www.epa.gov

Combined Sewer System

≈540 acres (6.4% of total City area)

Four Outfalls

- Combined Sewer Overflow 001
  Receiving Waterbody: Oronoco Bay
- Combined Sewer Overflow 002
  Receiving Waterbody: Hunting Creek
- Combined Sewer Overflow 003
  Receiving Waterbody: Hooff's Run
- Combined Sewer Overflow 004
  Receiving Waterbody: Hooff's Run
- Combined Sewer Overflows (CSOs) permitted by the Virginia Department of Environmental Quality (VDEQ)

Combined Sewer Overflow (CSO) Locations

Hunting Creek – CSO-002

Oronoco Bay – CSO-001

Hooffs Run – CSO-003 & 004

CSO Frequently Asked Questions

What factors influence the frequency, duration, and volume of overflows?

number of rain events
frequency of the events
intensity of the events
characteristics of the sewershed
characteristics of the specific outfall

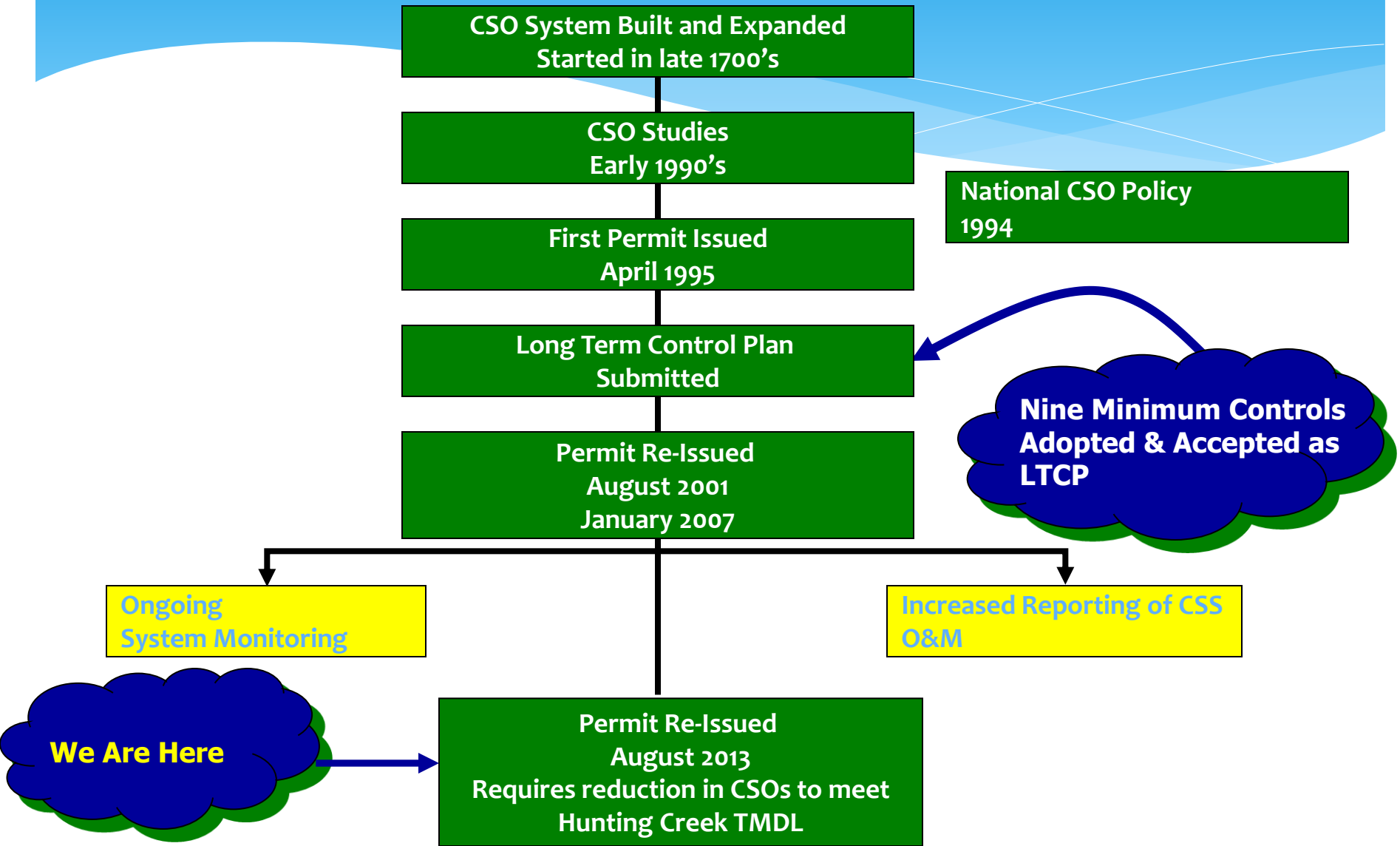
How frequently do the overflows take place?
Typically 30 to 60 times/year

How long the overflow events last?
Typically 2 to 5 hours typically

What is the total number of hours this occur over a year?
Equivalent of 3 to 12 days, depending on the outfall

How much of the overflows is stormwater, and how much is wastewater?
Greater than 90% of the overflows is stormwater

Short History of Alexandria's CSS



Alexandria Combined Sewer System Program

* Management practices: Technology-based Nine Minimum Controls (NMCs). Current Long Term Control Plan
* Monitoring programs for the receiving water bodies and outfalls
* Improvements to the Combined Sewer System infrastructure
* Reduction of the combined sewer area during redevelopment

August 2013 Permit

* Addresses changes in regulations
  - Hunting Creek Bacteria Total Maximum Daily Load (TMDL)
  - Impacts Outfalls 2,3, and 4
* Near-term requirements (within 5-year permit cycle)
* Long-range planning needed in order to meet the TMDL

Clean Water Act Goals
Total Maximum Daily Load (TMDL)

* Clean Water Act goal that all waters of the United States be “fishable” and “swimmable”
  - State develops impaired waters list and TMDLs

Hunting Creek Bacteria Total Maximum Daily Load (TMDL)

* <u>Hunting Creek Bacteria TMDL and CSOs:</u>
  - Requires 99% bacteria reduction from combined sewer overflows in Hooff's Run (Outfalls 003 and 004)
  - Requires 80% bacteria reduction from combined sewer overflows in Hunting Creek (Outfall 002)
  - Total overall bacteria reduction from CSO discharges of 86%
  - Applicable to Outfalls 2, 3, and 4 only

Permit Requires Long Term Control Plan (LTCP) Update

* Long Term Control Plan (LTCP) Update – a plan that will provide a path for the City to meet the Hunting Creek Total Maximum Daily Load (TMDL)
  - Draft Work Plan due to VDEQ May 2014
  - Final LTCPU due to VDEQ August 2016

* Plan must be completed by no later than 2035

* Extensive community education and outreach will be included

LTCP-Update Development
Typical CSO Control Strategies

* Storage: storage tanks, in-line storage, tunnels
* Separation: fully separate all storm and sanitary sewers in Old Town
* Green Infrastructure: reduce the amount of runoff reaching the combined sewers
* Combination: storage, separation, and green
* Other options and combination of options will be evaluated as well

CSO Control Impacts and Challenges

* Construction in old and historic area
* Significant conflict with existing utilities
* Existing infrastructure is old and antiquated and may require rebuilding beyond planned sewer work
* Quality of life: disruption to community and businesses
* Economic: loss to business and tax revenue
* **Order of magnitude costs:** up to ~$300 million

Near-Term Permit Requirements

* Incorporation of the **Area Reduction Plan** as part of redevelopment

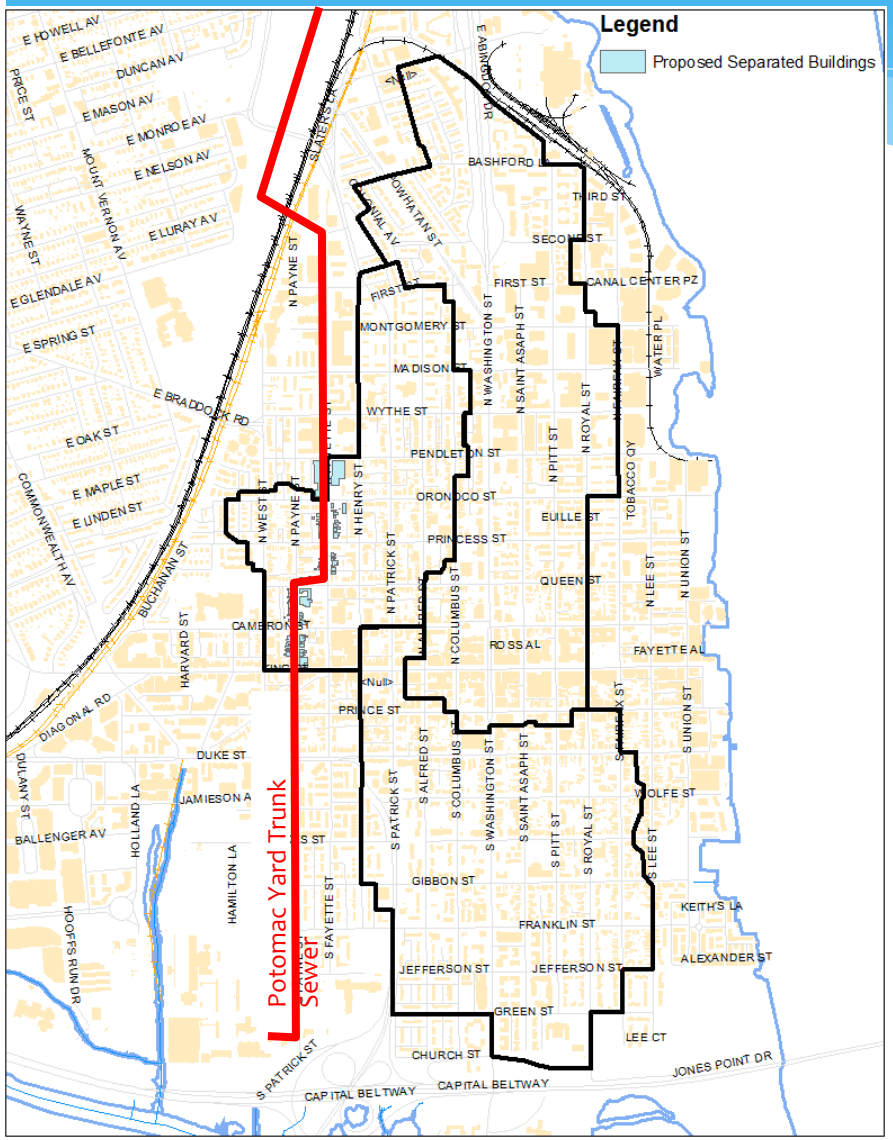
* **5MG reduction of Stormwater or Stormwater Equivalent** – reduce water quality impacts
  - Payne & Fayette Sewer Separation (60- 92 laterals)
  - Combined Sewer Outfalls 003 and 004 Improvements – capture more flow and send to wastewater treatment facility

* **Green Initiative** - study, implement, and promote green infrastructure
  - Green Public Facilities – during major maintenance/enhancement projects
  - Green Infrastructure Database – track installation and maintenance

* **$2.5M for CSO abatement**

* **Evaluation of Tidal Intrusion at CSO-002**

Payne & Fayette Project Description



- Includes separation of at least 60 properties
- Sanitary sewers to be disconnected from the combined system and reconnected to the Potomac Yard Trunk Sewer
- Work to be confined generally to the following intersections :
  - N Fayette & Oronoco Sts
  - N Fayette & Princess Sts
  - N Fayette & Queen Sts
  - N Payne & Queen Sts
  - N Payne & Cameron Sts
- Separation of sanitary sewers will improve water quality

Payne and Fayette Separation

Legend

- PYTS Manholes
- PYTS Sewer
- Separated Buildings
- Buildings

Proposed Buildings for Separation
Payne & Fayette Sewer Separation Project

City of Alexandria, Virginia
December 2012

GREELEY AND HANSEN

Payne & Fayette Project Schedule

* Project currently in the design phase

* Anticipated schedule:
  - Design complete: Spring 2014
  - Construction: Earliest Fall 2014/Winter 2015

* Approximate Cost: $1M

CSO 003 Improvements

* Purpose:
  - Construct new CSO diversion chamber on West Street, just north of King Street
  - New structure will improve hydraulic function, prevent clogging and require less maintenance
* Construction Start: January 6, 2014
* Construction Contract: 180 days
* Impacts to traffic and parking in project vicinity
* Public meeting: 7:00pm, Monday December 9, 2013, Durant Center, 1605 Cameron Street

CSO 003 Improvements

Types of Green Infrastructure

- Under Consideration
  - Permeable Pavement
    - Alleys
    - Parking Lanes
    - Sidewalks
  - Bioretention
  - Rain Barrels
  - Tree Boxes
  - Green Roofs

Public Outreach

* Already begun. Follow "*What's Next Alexandria*"
* City web site
* Presentation to Environmental Policy Commission, July 15th, 2013
* Public Hearing August 5th, 2013, additional hearings planned
* Presentations at key civic associations
* Additional ideas for outreach and to receive public input welcomed

New Stormwater Regulatory Changes

* Chesapeake Bay Total Maximum Daily Load (TMDL) for Nitrogen, Phosphorous, and Sediments

* Implementation Vehicles for State:
  - Municipal Separate Storm Sewer System (MS4) Permit
  - New State Stormwater Management Regulations
    - Public Meeting (hosted by EPC) - November 18th 2013
    - Federation of Civic Association – December 02nd 2013

Questions/Suggestions

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